



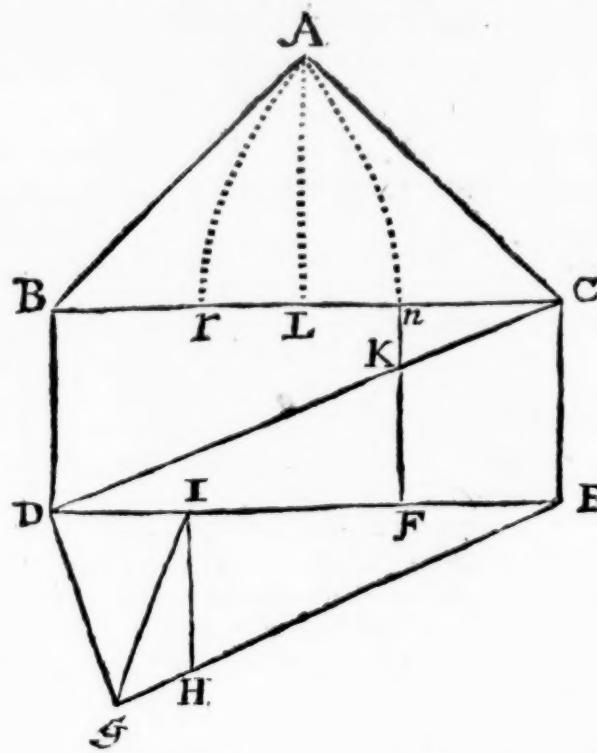
The Athenian Mercury:

Saturday, June 3. 1693.

We shall here according to our Promise sometime since, endeavour the Resolution of the best of those Mathematical Theorems and Problems which have been sent in unto us, and tho we have (to save what Charge We could to the Bookseller) put six Questions into one Diagram, We shall take care to treat of 'em with that distinction, as will give the Reader no more trouble than if every Question had its particular Diagram affixt to it.

Quest. 1. **L**et A B C be a right-angled Triangle, and B L a Segment of the Base made by letting fall the Perpendicular A L.

$AC = b = 2.425$ given. The side A B = a
 $BL = c = 1.73$. S requir'd?



Ans. This Question is much more easie than some of the following, since the Base and perpendicular are equal, this Triangle being an Isosceles: But We shall wave that Consideration, and work to find a general Theorem upon a contrary Supposition, since all Right-angled Triangles that have a Perpendicular let fall upon their Base, and have only any 2 sides given out of the 5. may easily have their Solution:

As $c. a :: a aa = BC$: and $\frac{aa}{c} - c = \frac{aa - cc}{c}$
 $= L. C$ the Square, of which is $\frac{aaaa - 2aacc + cccc}{cc}$
 $+ cccc.$
 But $aa - cc = bb - \frac{aaaa - 2aacc + cccc}{cc}$
 $= bbcc - aaaa + 2aacc - cccc.$

That is, $aacc - cccc = bbcc - aaaa + 2aacc - cccc$. Hence also $aaaa - ccaa = bbcc$, which when reduc'd gives $a = 2.4 +$.

Quest. 2. Let A B C be a Right-angled Triangle, as before,

$Br = b = 1.05$ are given, r n is re-
 $Cr = c = 1.05$ quir'd?

Ans. By the 1 and 2 the Square of the parts of the Line B C are equal to the Square of the whole, also B n being equal B A, and C r equal C A, the Equation is $2bc = aa$, the Square Root of which is easily extracted.

Quest. 3. Let A B C be a Right-angled Isosceles Triangle, n C = m is only given, what is $A B = a$?

Ans. The Remainder of the Hypotenuse B n being = a, also C A = C A, therefore by 47 and 1. $aa + 2am + mm = 2aa$, that is, $\sqrt{2mm + m} = a$.

Quest. 4. Suppose B F a Parallelogram, or Oblong Square,

$B N = DF = b = 2.4$ } are given, also when
 $BD = n F = c = 1.4$ } B C is drawn an infinite line K C = d = 1.12 is given?

Ans. Now its requir'd to give a general Theorem for the length of the whole Diagonal D C, the length of K C being always first limited?

Ans. Let Z represent the whole Diagonal, then it will be

As $Z - d \cdot d :: b. \frac{db}{z-d} = nC$, but $nC +$

$Bn = BC = \frac{zb}{z-d}$.

But $zz - cc = \frac{zzbb}{z-d} + \frac{zzdd}{z-d} - 2zdd - zzcc + zzdd - 2zccd - ccdd$.

Hence this Equated Theorem,

$$\frac{zzbb}{z-d} + \frac{zzdd}{z-d} - 2zdd - zzcc + zzdd - 2zccd - ccdd.$$

Which Quadratic if reduc'd according to the late Methods of Converging Series, will give $Z = 3.7$ Proxime, d being included, Which was to be done.

Quest. 5. Let D K F, D C E be similar Right-angled Triangles,

$C E = d$
 $K C = c$ } are given, what is the side DB = a?

$D F = b$ } b

Ans. As $a. b :: c :: \frac{bc}{a} = DK$, but $\frac{bc}{a} + c = \frac{bc + ac}{a} = DC$, the Square whereof is

$$\frac{bbcc + 2bcc + aacc}{aa} = bb + 2ba + aa + dd$$

(per

(per 47. e. i.) hence arises this equated Theorem,

$$aaaa + 2baaa + dd \left. \begin{array}{l} + bb \\ - cc \end{array} \right\} aa - 2bcca = bbcc.$$

Now supposing $c=15$. and $d=24$. and $b=20$; If this Equation be reduced into a Numeral Exegeſis, those that will be at the labour will find $a=12$.

Quest. 6. Let DHE be a plain oblique angled Triangle, the Perpendicular HI falls within, and the Perpendicular DG falls without,

$$\left. \begin{array}{l} IE = d = 97 \\ GD = s = 68 \\ GH = b = 51 \end{array} \right\} \text{are given, } HI = a \text{ is requir'd?}$$

Anſw. The Triangles EDG and EIH being ſimilar, it will hold.

$$\begin{aligned} \text{As } a \cdot d &:: s \cdot \frac{ds}{a} = GE. \text{ and } \frac{ds}{a} - b = \frac{ds - ab}{a} \\ &= HE, \text{ which ſquare'd gives } ddss - 2dsab + aabb \\ &= dd + aa \text{ (per 47 e. i.)} \end{aligned}$$

Hence this Equation,

$$\left. \begin{array}{l} aaa + dd \\ - bb \end{array} \right\} aa - 2dsba = ddss, \text{ which reduced gives } a = 42 \text{ prop̄.}$$

There are ſome more Questions which we ſhall conſider at ſome other time, and in the mean while ſhould be glad to hold private Correspondence by Letters with any Ingenious Annalists.

Quest. 7. Pray Gentlemen, what is Chyle ? and how made ?

Anſw. Chyle is a pretty thick white Juice, like Barley Cream, made out of the Aliments taken in this manner, while the Meat is chewing in the Mouth it is mix'd with the Saliva, which not only softens it, but endows it with a certain fermentative quality, unto which contributes also the Drink, (whether Bear or Wine, &c.) which often contains in it Acrimonious Particles, and fermentaceous Spirits. The Stomach by the help of its Fibres embraceth closely the Meat thus chewed and swallowed, and mixeth therewith ſpecifick fermentaceous Juices, bred in its inner Coat, and impregnated with the Saliva, then by a convenient Heat there is made a Mixture and Eliuation of all, for that the fermentaceous Particles entring into the Pores of the Meat, do paſs through, agitate and eliuate its Particles, ſeparating the purer from the Crabs, and making them more fluid, ſo that they make another form of Mixture, and unite among themselves into the reſemblance of a Milky Cream, after which together with the thicker Maſs with which they are yet involved, by the Conſtriction of the Stomach they paſs down to the Guts, where by the Mixture of the bile and pencreatick Juice they are by another manner of fermentation quite ſeparated from the thicker Maſs, and ſo are received by the Lacteal Veffels, as the thicker is ejected by Stool.

Quest. 8. How is the Chyle turn'd into Blood ?

Anſw. 'Tis done in this Manner, the Chyle out of the Receptaculum Chili ascending by the Ductus Thoracicus, and flowing into the Subcarian Vein, together with the returning Venal Blood, is poured by the Vena Cava into the right Auricle, and ſo into the right Ventricle of the Heart in its Diaſtole or Relaxation, then by its Systole or Contraction it is driven from thence into the Lungs, from whence it ascends again into the left Auricle first, and then into the left Ventricle of the Heart, out of which it is Expelled through the Aorta, and paſſing

along with the Blood through the Arteries of the whole Body, returns again with it by the Veins to the Heart, for it undergoes many Circulations before it can be affiſilated to the Blood.

'Tis evident from hence that if one let Blood 4 or 5 Hours (or later) after a full Meal there will a great quantity of the Milky Chyle it ſelf ſwim atop of the Coagulated Blood.

Advertisemens.

This is to give Notice that Mr. Increase and Mr. Cotton Mather's New Diſcourse concerning the New-England WITCHES and WITCHCRAFTS, are now arriv'd, to which will be added the Observations of a Person who was upon the place 6 or 7 days, when the ſuspected WITCHES were first taken into Examination : As also an APPENDIX, giving an Account of the late Diſpoſeſſion of a Person in England by Fasting and Prayer ; Printed by the Conſent of the Miſtress chiefly concern'd, with a Preface to it by a Reverend Divine living in London. These being all Licensed and Entered in the Hall-Book, will be ſpeedily Published. Printed for John Dunton at the Raven in the Poultry : Of whom is to be had Mr. Cotton Mather's First Account of the Tryals of the New-England Witches, Printed on the ſame ſize with this Last Account of Mr. Increase Mather's, that they might Bind up together.

ON Wednesday the 13th. and Thursday the 14th. of June, at the Outropers-Office at the West End of the Royal Exchange in Cornhill, will be Sold by way of Mining, a Method not hitherto used in England, a Curious Collection of Paintings and Limnings, fit for Halls, Chimneys, Stair-Cases and Closets, being Pictures of the moſt Eminent Masters in Europe, viz. Titian, Tinocet, Rubens, Vandyke, Rembrant, Frank, Posſein, Jordans, and ſeveral other great Masters, both Ancient and Modern, not here inserted. By Edward Millington. And all Persons that cannot come at the Time of Sale may Buy them at the Prizes now prefixt, either before or after. The Sale begins at Three of the Clock, to Sell by Day-light each Afternoon.

Elixir Stomachicum : Or, the great Cordial Elixir for the Stomach ; of a delicate Flavour, and pleasant bitterish Tafe : Not Purging, but Cordial only ; to be drank at any time, (but especially in a Morning) in any Liquor, as Ale, Tea, Mum, Canary, White-Wine, A Dram of Brandy, &c. It makes the beſt Purl in the World in Ale, and in Canary, Tea, &c. very pleasant and wholesome, far exceeding Purl made of Wormwood, which (being ſo hot and drying) burns the Sight, and dries the Blood very much : This having the Quinteſcence of all the Ingredients of the bitter Draught in it, and many other excellent Stomachicks brought into a ſmall quantity, as that 30 or 40 Drops is a Dose ; you may make it at your pleasure in a Glaſs of White-Wine, Tea, or other Liquor ; it procures a good Appetite, helps Diſtillation, expels all Wind, Strengthens the Stomach, purifies the Blood, and destroys the Scurvy, with many other Virtues mentioned in the Bills given with it ; but theſe ſix things (eſpecially) it does beyond belief, without you experience it. Price One Shilling each Bottle.

It is to be Sold by Mr. John Dunton at the Raven in the Poultry ; and at theſe Coffee-houſes, Viz. Symonds-Inn in Chancery-Lane, at Vigure's in the Old Pallace-Yard, Westminſter, Viſtuallying-Office at Tower-Hill, Man's at Charing-Cross, Eſſex at Whitechappel, North's in King-street by Guild-Hall, Richard's at Temple-bar, Smythers in Thames-street, Will's in Covent Garden, Blacketts at Spittle-fields, Wetts at the Postern in Aldermanbury, John's in Fuller's Rents, Buckeridge's without Aldersgate, Hamet's on London-bridge, Brown's at Wapping Old-ſtaffs, John's by the Kings-bench, Jonathan's in Exchange Alley, Smith's at Lambeth, by the Church, Cleve's at Greenwich, by the Church ; by Mr. Tho. Collet Jun. near the Hermitage, Tobacco-ſtreet ; Mr. Leavington, Fruiterer at the Royal Exchange, and Tho. Howkins in George-yard in Lombard-street.